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*Indian Standard*  
**SPECIFICATION FOR  
CAST IRON STEPS FOR MANHOLES**

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**BUREAU OF INDIAN STANDARDS**  
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG  
NEW DELHI 110002

**Gr 2**

*February 1970*

# *Indian Standard*

## SPECIFICATION FOR

### CAST IRON STEPS FOR MANHOLES

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NEW DELHI 110002

*Indian Standard*  
SPECIFICATION FOR  
CAST IRON STEPS FOR MANHOLES

**O. F O R E W O R D**

**0.1** This Indian Standard was adopted by the Indian Standards Institution on 2 December 1969, after the draft finalized by the Water Supply and Sanitation Sectional Committee had been approved by the Civil Engineering Division Council.

**0.2** Cast iron steps ( rungs ) are commonly fitted in the walls of manholes for providing access to the sewers from the manhole openings. They should be of proper quality and suitably designed so as to ensure safety of persons using them and there have been cases of accidents due to unsatisfactory designs. This standard has been prepared to give guidance for the proper manufacture and construction of cast iron steps and it is hoped it will be found useful by the Public Health Engineering Departments, Municipal Corporations and others.

**0.3** This standard contains clauses **3.3.1** and **5.1** which call for agreement between the purchaser and the supplier.

**0.4** For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS : 2-1960\*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

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**1. SCOPE**

**1.1** This standard lays down the requirements for cast iron steps for manholes.

**2. MATERIAL**

**2.1** The steps shall be of suitable quality grey cast iron not inferior to grade 15 of IS : 210-1962†.

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\*Rules for rounding off numerical values (*revised*).

†Specification for grey iron castings (*revised*) (Since revised).

### 3. MANUFACTURE

**3.1** The steps shall be clean, well-cast and they shall be free from air and sand holes, cold shuts and warpings which are likely to impair the utility of the castings.

**3.2** The portion of the step which projects from the wall of the manhole shall have a raised chequered design to provide an adequate non-slip grip. Any ribs, chequering, lettering or other projection for this purpose shall be raised above the general plane of the top surface of the step and shall be placed particularly along the edges of the tread. It is considered that in this position the most protection is given against slip.

NOTE — The chequered pattern shown in Fig. 1A and Fig. 1B shall not be regarded as of a particular design.

**3.3** The dimensions of steps shall be as shown in pattern 1, or pattern 2 of Fig. 1A and Fig. 1B. A tolerance of  $\pm 2$  mm shall be permissible on the dimensions.

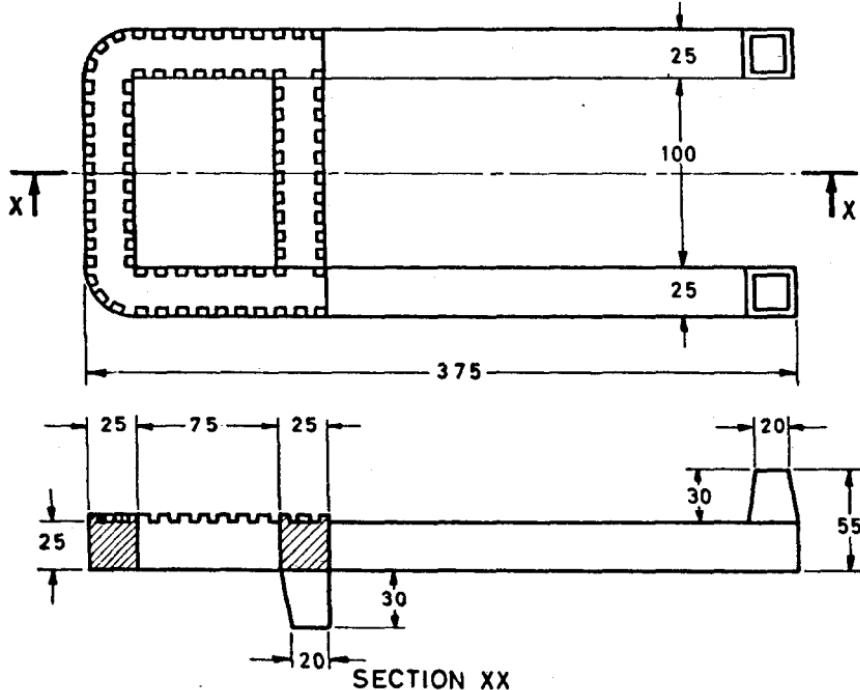


FIG. 1A CAST IRON STEPS FOR MANHOLE (PATTERN 1)

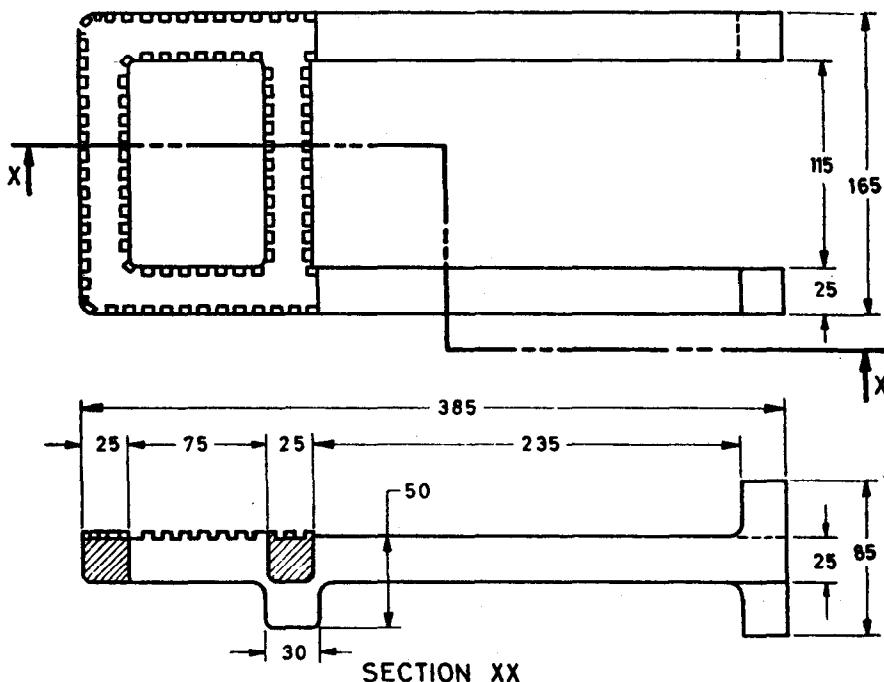


FIG. 1B CAST IRON STEPS FOR MANHOLE ( PATTERN 2 )

**3.3.1** The steps may be manufactured in other dimensions where so agreed to between the manufacturer and the purchaser.

**3.4 Minimum Weights** — The minimum weights of cast iron steps shall be as under:

Pattern 1 4.5 kg

Pattern 2 5.3 kg

#### 4. COATING

**4.1** The cast iron steps shall be coated with a material having tar base or with a black bituminous composition or cashew-nut shell liquid. The coating shall be smooth and tenacious. It shall not flow when exposed to a temperature of 63°C and shall not be brittle as to chip off at temperature of 0°C.

## 5. TESTS

**5.1** One sample of step out of 50 samples may be subjected to a load test as given in Appendix A where so agreed to between the manufacturer and the purchaser. If this test is required the arrangement (which shall include the cost of the test) shall be as agreed to between the manufacturer and the purchaser.

## 6. MARKING

**6.1** Each cast iron step shall have the following information:

- a) Manufacturer's name or trade-mark, and
- b) Pattern (*see 3.3*).

**6.1.1** Each cast iron step may also be marked with the ISI Certification Mark.

**NOTE** — The use of the ISI Certification Mark is governed by the provisions of the Indian Standards Institution (Certification Marks) Act and the Rules and Regulations made thereunder. The ISI Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well-defined system of inspection, testing and quality control which is devised and supervised by ISI and operated by the producer. ISI marked products are also continuously checked by ISI for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the ISI Certification Mark may be granted to manufacturers or processors, may be obtained from the Indian Standards Institution.

## A P P E N D I X A

( *Clause 5.1* )

### LOAD TEST

#### A-1. DETAILS

**A-1.1** The test specimen shall be clamped in a horizontal plane so as to leave only the tread portion projected as a canti-lever in the manner shown in Fig. 2. It is important that the position of the centre nib shall be accurately placed so as to perform its proper function in the canti lever position.

**A-1.2** A load of 225 kg shall be applied vertically at a point at the centre of the front tread (*see Fig. 3*). This load shall be applied gradually and without stop. The test specimen shall withstand the load for a period of one minute without signs of cracking or other injury or permanent setting.

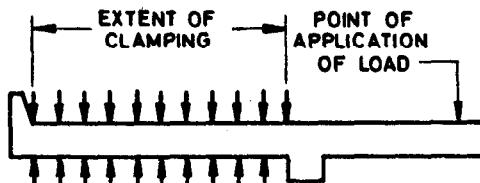


FIG. 2 INDICATION OF MANNER OF SUPPORTING CAST IRON STEP FOR PROOF LOAD TEST

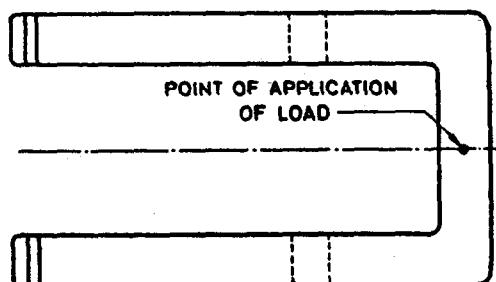


FIG. 3 INDICATION OF LOAD APPLICATION FOR PROOF LOAD TEST

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